Product inspection equipment delivers patty perfection

When it comes to physical contamination, food retailers increasingly expect suppliers to work with them to ensure that codes of practice and brand quality standards are met at all times. The primary driver is, of course, consumer safety; but protecting reputation and avoiding costly product recalls is also key for the brand owners.

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For the meat and poultry manufacturers tasked with upholding safety and quality, investment in the latest inline inspection technologies not only improves contamination detection and product quality, but also production efficiency – as a recent application at Bell Foods Group demonstrates.

Bell is one of the major processors of meat and convenience products in Europe and has supplied a well-known international fast food chain with premium products for several decades. Increased customer requirements and demands in terms of quality assurance and production capacity gave the company the push to rethink the configuration of their production line for burger patties. Bell decided to dismantle their existing line, carry out a hall conversion and replace individual production line components as part of modernisation measures.

They chose a new X39 x-ray inspection solution from Mettler-Toledo to support the improvements in their quality regime. Specifically designed for free flow, frozen formed food applications, the X39 conducts 10 integrity checks across multiple lines and accurately targets individual patties for removal in real-time – irrespective of product position and without the need to stop production.

This significantly reduces waste, rework and downtime to deliver bottom-line savings. The purchase decision was made after Bell had experienced the X39 in real time at two comparable sites in Ireland and Germany.

"I think x-ray inspection is currently the ultimate extra that we can offer our customers when it comes to detecting foreign bodies in the burger patties," says Nicky Berger, who is responsible for the quality management of fresh goods at Bell's Oensingen site in Switzerland.

Contamination and beyond

Along with metallic contaminants, the X39 can detect various additional foreign bodies that are commonly found in meat: including calcified bone and cartilage, stones, high-density plastic or glass. The system also provides a whole range of other options for checking the patties for product errors and visual defects: such as patties joined together, holes, dents and product flakes.

The X39 has a two-stage inspection process that enables meat product manufacturers to deliver the highest levels of product consistency and quality with a single machine. The first stage uses integrated laser technology that determines conformity with pre-programmed product parameters for length, width and height, as well as checking for any flake defects. Non-conforming products are rejected, while good product continues to the second integrity check.

The second check uses an x-ray detector to inspect the remaining good product for foreign-body contaminants such as calcified bone, mineral stone, glass, metal and high-density plastic; while simultaneously checking for holes, dents and edge defects, plus any anomalies in mass and shape.

At each stage reject nozzles, using jets of air, accurately target and remove non-conforming products down a gap between consecutive conveyors into a primary rework bin for high accuracy sorting. If the product is too large to fit in the gap – for example two patties joined together – a rejection flap will automatically remove the item.

For maximum operational efficiency, the X39 is equipped with advanced software that makes the system very simple to operate and is designed to ensure that the technology is always fully optimised. Product changeovers are very quick because menus can be stored, reducing human error. The software monitors all aspects of the system and provides pre-warnings of the accuracy of the lasers, reject nozzles and reject confirmation sensors. In addition, the technology records and collects all inspection results for due diligence and food safety legislation requirements.

The X39 is IP69 rated and is designed for ease of cleaning and maintenance to minimise downtime, in line with European Hygienic Engineering and Design Group

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Bell Food Group is producing perfect burger patties using a new X39 x-ray inspection solution from Mettler-Toledo that checks for contaminants and defects.

Bell's new x-ray inspection system checks in excess of a million patties a week for physical contaminants and visual defects.

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(EHEDG) and National Sanitation Foundation (NSF) guidelines to meet the highest hygienic standards required by manufacturers working with raw food products.

Improved product integrity checks

The X39 inspection system at Bell Foods facility currently checks in excess of a million patties a week – most of these being the company's three standard products, which vary in terms of size, form and weight.

Ueli Schönenberger, who is in charge of patty production at Bell, observes: "We used to remove patties that were broken or had holes in them from the belt by hand or separate them manually before packaging. Thanks to the X39, the line manager now defines the tolerance limits for visual defects and the system will reject patties which do not meet the standards."

Depending on the variant of burger patty that Bell is producing, the x-ray system will need to inspect between three and six lanes. If a visual defect is detected, the relevant patty is rejected using multi-lane air nozzles. This significantly reduces the volume of patties rejected in comparison to simpler x-ray system variants that reject the entire batch from production. Bell can even differentiate between individual reasons for rejection.

"Thanks to the X39, we can first define and save the tolerance parameters for individual reasons for rejection," added Ueli. "Then we can get an extremely detailed picture of how many patties were rejected as the result of foreign bodies, such as bone and cartilage, or as the result of visual defects.

"An image of each individual rejected patty is saved in the image library so that we can analyse exactly where and how the problems occurred. In my opinion, the combination of all these capabilities in one system is far more than other providers can offer."

Once the patties enter the X39, its integrated control laser checks if the patties have been separated properly: otherwise these patties are rejected and prepared for rework. This minimises product loss for the customer without losing out on any of the benefits of the product integrity check solution.

Future proofed

Within the first few months of operation, the majority of product settings and tolerance limits for each patty variant have been validated and saved in the X39. Employees therefore only have to select a product from the product library in order to run the inspection process, based on the pre-approved product data. While employees can carry out calibrations and rectify simple defects, line managers have further access options that enable them to carry out additional settings changes on the x-ray system.

"In future, we also want to archive all data collected by the X39 within a network and evaluate it," Nicky added. "This makes it easier for us to pass on quality indicators to customers. In turn, the customers can then analyse the figures for their own quality optimisation processes."

Ueli concludes, "The x-ray technology provides us with enormous benefits in terms of quality assurance. We inspect the patties not only to check for foreign bodies, but also to ensure that the patties have no visual defects. This simplifies packaging and the customer receives a perfect-looking burger." ■

Integrated software enables product parameters to be stored for quick changeover and reasons for rejection to be analysed, with quality indicators passed on to customers.